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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,339	03/27/2001	Yoshihiro Hama	P20338	8905

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EXAMINER

PHAM, HAI CHI

ART UNIT	PAPER NUMBER
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2861

DATE MAILED: 12/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/817,339

Applicant(s)

HAMA ET AL.

Examiner

Hai C Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The amended claim 4 recites the following limitation "wherein the third optical path ... passes between said polygon mirror and said first lens", which appears to be misleading in that **not** all the light beams have their third optical paths passing between said polygon mirror and said first lens. There is indeed only one light beam, which exposes the object located closest to said polygon mirror, which has its third optical path passing between said polygon mirror and said first lens. In order to examine claim 4, the original content of claim 4 will be assumed until the Applicants say otherwise.

Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA

Art Unit: 2861

1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 2, 4, 9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 5 of U.S. Patent No. 6,636,340 in view of Maruyama (U.S. 6,346,957).

Claims 1 and 5 of the above-mentioned U.S. Patent include all the basic limitations in claims 1, 2, 4 and 9 of the current Application in spite of a slight difference in wording, namely:

Current Application:

U.S. patent No. 6,636,340:

[Claim 1] a light source that emits a plurality of light beams	[Claim 1] a light source that emits a plurality of light beams
a polygonal mirror that scans by deflecting the light beams emitted by said light source	a polygonal mirror that deflects the light beams emitted by said light source to scan
an optical system that converges the deflected light beams on a plurality of objects to be scanned	an optical system that converges the deflected light beams on a plurality of objects to be scanned
the plurality of objects being arranged on a side, with respect to said polygonal mirror,	said plurality of objects being arranged on one side of said polygonal mirror, said

in which said light beams scan, from a position closer to said polygonal mirror to a position farther from said polygonal mirror	plurality of objects located at different distances from said polygonal mirror, respectively,
said optical system including a plurality of optical path turning systems that turn optical paths of the deflected light beams, optical path lengths of the optical paths being substantially the same	said optical path turning system being configured such that optical path lengths of the optical paths of the deflected light beams are the same
[Claim 2] an $f\theta$ lens including a first lens, a second lens and a plurality of third lenses, all the deflected light beams passing through said first lens and said second lens, each deflected light beam passed through said first lens and said second lens passing through one of the plurality of third lenses, said plurality of optical path turning systems receiving said plurality of light beams that emerge from said second lens and directing the received light beams to said plurality of third lenses	said optical system including a plurality of $f\theta$ lenses, ... said plurality of $f\theta$ lenses including at least a first $f\theta$ lens, a second $f\theta$ lens and a plurality of third $f\theta$ lenses, all the light beams deflected by said polygonal mirror passing through said first and second $f\theta$ lenses, each of the plurality of light beams passing through said first and second $f\theta$ lenses passing through a respective one of said plurality of third $f\theta$ lenses
[Claim 4] the third optical path is located closest to said polygonal mirror and	one of said plurality of optical paths directed to an object located closest to

passes between said polygonal mirror and said first lens	said polygonal mirror includes a portion passing between said polygonal mirror and said first f θ lens
[Claim 9] each of said optical paths is configured such that the beam proceeding along the second optical path is directed on an opposite side, with respect to the first optical path, of said objects to be scanned	[Claim 5] more than half of the optical paths are configured such that the reflected beam is firstly directed in a direction away from an object prior to being directed towards the object

but except for all of said optical path turning systems including an even number of reflection surfaces.

Maruyama discloses a multi-beam scanning apparatus comprising a light source (25) emitting a plurality of light beams, a single polygon mirror (29), an optical system including a common set of first and second f- θ lenses (30) and a plurality of optical path turning systems for turning optical paths of the deflected light beams, respectively, each of the plural optical path turning systems including an even and equal number of reflecting surfaces (formed by the separating mirror 31 and each of the respective mirrors 232a-232d) (Fig. 14A), toward the surface to be scanned of the photoreceptor drums (24a-24d), wherein the optical path lengths of the optical paths of the respective deflected light beams are kept equal to one another (col. 7, lines 1-6) such that similar size spots are obtained on each photoreceptor.

Art Unit: 2861

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the optical path turning system with respective pairs of reflecting mirrors as taught by Maruyama. The motivation for doing so would have been to obtain similar size spots on each photoreceptor and thus to enable correct formation of images on the respective photoreceptor.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Maruyama (U.S. 6,346,957).

Maruyama discloses a multi-beam scanning apparatus comprising a light source (25) emitting a plurality of light beams, a single polygon mirror (29), an optical system

Art Unit: 2861

including a common set of first and second f- θ lenses (30) and a plurality of optical path turning systems for turning optical paths of the deflected light beams, respectively, each of the plural optical path turning systems including an even and equal number of reflecting surfaces (formed by the separating mirror 31 and each of the respective mirrors 232a-232d) (Fig. 14A), toward the surface to be scanned of the photoreceptor drums (24a-24d), wherein the optical path lengths of the optical paths of the respective deflected light beams are kept equal to one another (col. 7, lines 1-6) such that similar size spots are obtained on each photoreceptor.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama in view of Tanaka et al (U.S. 6,473,105).

Maruyama discloses all the basic limitations of the claimed invention except for the third f θ lens, one of the optical paths having a third optical path passing between the polygon mirror and the first lens, the third optical path intersecting the first optical path, and the beam proceeding along the second optical path being directed on an opposite side, with respect to the first optical path, of said objects to be scanned.

Tanaka et al. discloses an optical scanning apparatus (Fig. 2) including a light source emitting plural light beams, a common polygon mirror (220) for deflecting the plural light beams, which pass through the common first and second $f\theta$ lenses (230 and 240) before being deflected by sets of mirrors (26) toward the respective third $f\theta$ lenses (251-254) to scan the respective photosensitive drums (21-24). Tanaka et al. further teaches one the optical path of the light beam scanning the closest photosensitive drum (21) having a third optical path passing between the polygon mirror and the first lens (230), and at least the third optical path intersecting the first optical path with the second optical path being directed on an opposite side, with respect to the first optical path, of the photosensitive drum.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Maruyama with the third $f\theta$ lens and to rearrange the positions of the reflecting mirrors such that the reflecting second optical path is directed away from the drum and the third optical path intersecting the first optical path as taught by Tanaka et al. The motivation for doing so would have been to provide a more compact configuration of the optical scanning system and at the same time a compensation system for correcting the wobble of the polygon mirror.

With regard to claims 5-7, Maruyama further teaches the reflecting surfaces being provided with sets of reflecting mirrors or prisms.

Art Unit: 2861

9. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama in view of Tanaka et al., as applied to claims 1-4 above, and further in view of Kamikubo (U.S. 6,115,164).

Maruyama, as modified by Tanaka et al., discloses all the basic limitations of the claimed invention except for the refractive power characteristics of the f- θ lenses.

Kamikubo discloses a scanning optical system in which the f- θ lenses include a first imaging lens (21), a second imaging lens (22) and a third imaging lens (30), wherein the first and the second imaging lenses have positive power in the main scanning direction while the third imaging lens has a strong positive power in the auxiliary scanning direction such that the balance of the refractive power of the imaging lenses as a whole is maintained (col. 4, lines 40-62).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the set of imaging lenses of the modified device of Maruyama having the refractive power characteristics as taught by Kamikubo such that the light beam passing through the set of imaging lenses is properly converged in both the main and auxiliary scanning directions to form a beam spot on the surface to be scanned.

Pertinent Prior Art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2861

Wang (U.S. 6,219,168) discloses in Figure 7 a raster output scanning system (330) for scanning a multiple photoreceptors (340, 346, 352 and 358) disposed on one side of the single polygon mirror (300) and located at different distances from the polygon mirror, the system including a light source emitting a plurality of light beams, which are deflected by the common rotating polygon mirror, all the deflected plural light beams passing through a common pair of f θ lenses (332 and 334) before being deflected by the respective sets of mirrors, each set having an even number of reflecting mirrors (336-338, 342-344, 348-350 and 354-356), onto the surface of the respective photoreceptors.

Response to Arguments

11. Applicant's arguments with respect to claims 1-112 and 15 have been considered but are moot in view of the new grounds of rejection presented in this Office action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (571) 272-1934. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2861

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM
PRIMARY EXAMINER

December 3, 2004